



Completing a Successful Large Scale Remedial Investigation (RI)- 9 MRP Sites at Stump Neck Annex, Naval Support Facility (NSF) Indian Head, MD

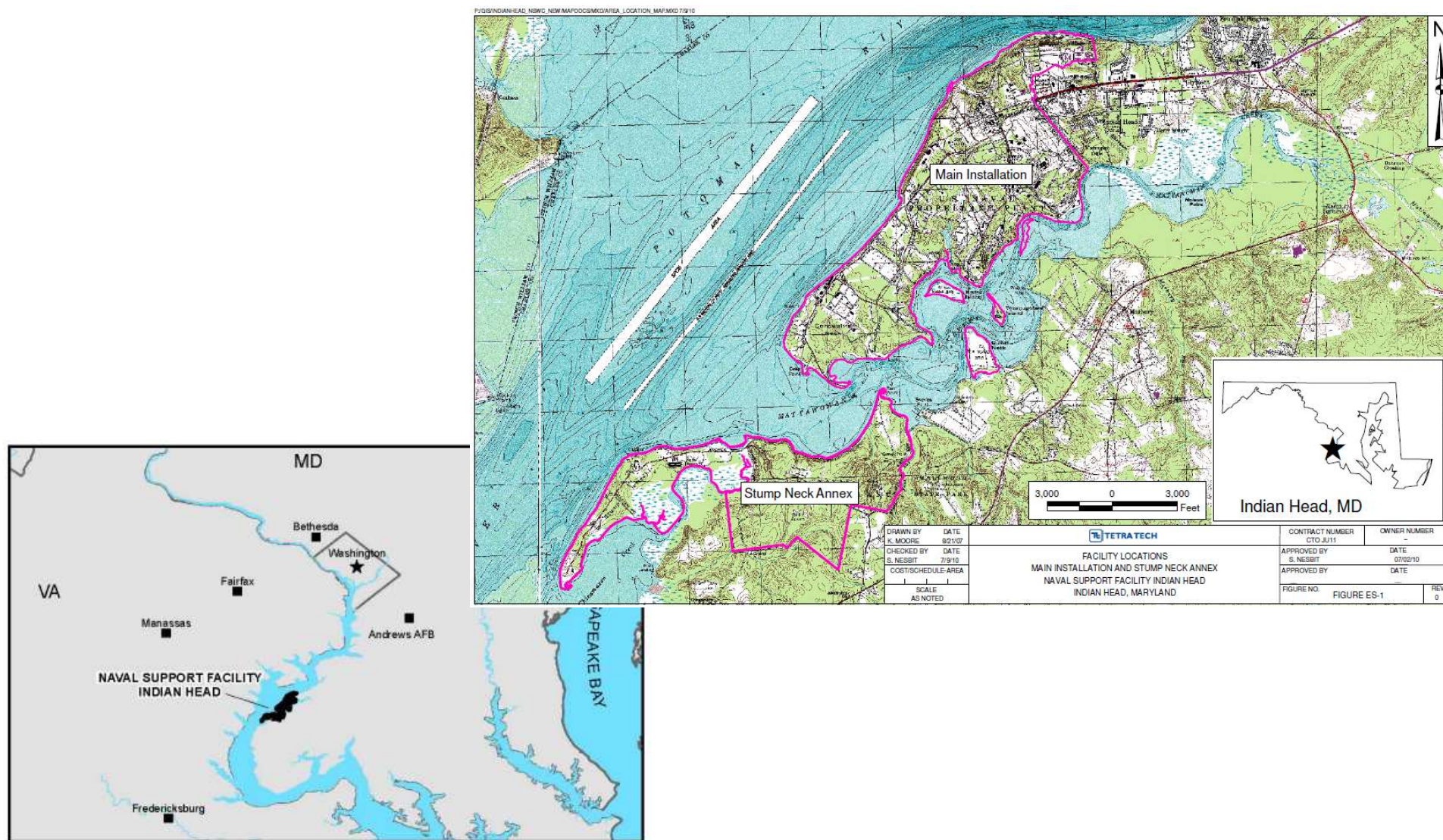
**Presented By
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Naval Facilities Engineering Command (NAVFAC)
Washington

Objective



- Present overview of RI intrusive work at 9 MRP sites at the Stump Neck Annex of Naval Support Facility, Indian Head, MD
- Discuss lessons learned
 - Explosive Safety Submission (ESS) challenges
 - Work Plan challenges
 - Scope of intrusive work (vs. removal action)

MRP Site Location



Site Names and Locations



Site History



- Preliminary Assessment (PA) completed in 2005
- Site Inspection (SI) completed in 2010 that included two phases:
 - MEC investigation (detector-aided surface sweeps followed by subsurface geophysics investigation)
 - MC investigation to determine presence or absence of contamination (included sampling of surface soil, subsurface soil, sediment, and groundwater and analyzing for metals, explosives, and volatile organic compounds (VOCs))
- A RI/FS was recommended for 9 sites based on MEC results
- MC sampling results recommended that 2 sites be evaluated further for groundwater

RI Approach



- RI approach was discussed and scoped with regulators and included:
 - 1) Conducting site surveys to identify boundaries of investigation areas
 - 2) Preparing the sites for geophysical and intrusive investigation by removing vegetation and surficial metallic debris
 - 3) Performing digital geophysical mapping surveys over extent of MEC areas
 - 4) Intrusively investigate subsurface anomalies to identify nature of the source
 - 5) Collection of soil/sediment samples to expand on previous site characterization
 - 6) Collection of soil samples from locations of explosively-detonated MEC items to confirm that detonation has not impacted site soils
 - 7) Utilizing both new and existing monitoring wells to delineate groundwater impacts

Key Message: For intrusive RI work, establish a reasonable level of effort to define nature and extent

ESS Challenges



- Two separate ESSs utilized for project due to project awards and phasing
- Each site had different exclusion zones (primary and contingency MGFDs) based on findings from previous Site Inspection work

Key Message: Choose a primary munitions item that you're likely to find and a contingency item that you may possibly find

- Numerous rounds of comments and responses to comments mostly due to:
 - Changes in project scope
 - Regulator comments on Work Plan
- First ESS took 18 months to reach final approval
- Second ESS took 9 months to reach final approval

Key Message: Allow ample time in project schedule for review and approval of ESSs

ESS Overview



- ESS originally reviewed by NOSSA in August 2013 (only included UXO 4 & 21)
- Later added UXO 5, 12, 15, & 25 to ESS
- Held ESS planning meeting w/NOSSA on 9/25/13 to discuss:
 - Site survey and prep
 - Geophysical surveys
 - Intrusive MEC investigation
 - MEC/MPPEH treatment and MDAS disposal
 - Soil/groundwater sampling/analysis
- March 2014- next version submitted for review
- Responses to comments and redlined version submitted July 2014
- February 2015- NOSSA and DDESB approval
- August 2015- modification to contract to add UXO 1, 2, 10, 23, & 28
- April 2016- Draft ESS for UXO 1, 2, 10, 23, & 28 submitted for review

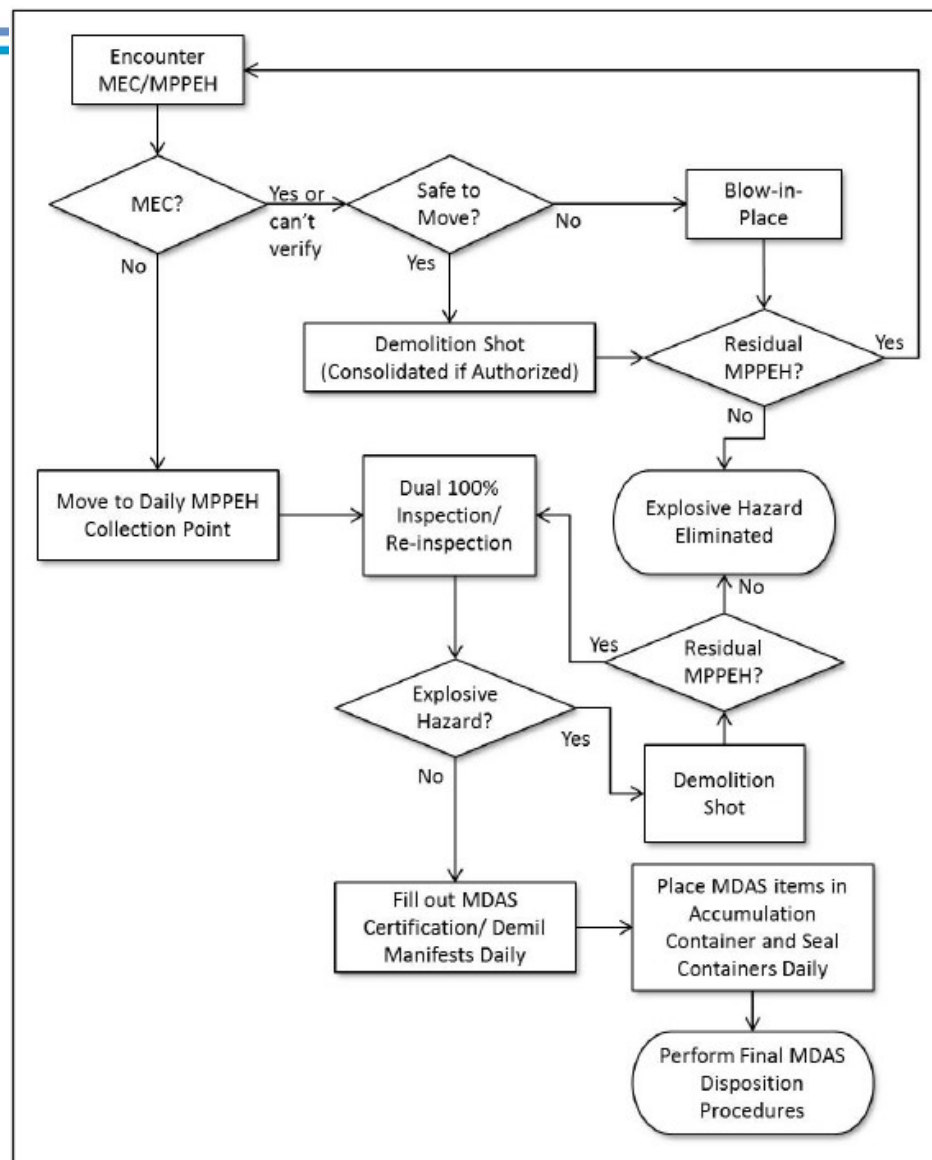
Key Message: Engage NOSSA early when preparing an ESS to minimize comments

ESS Overview



- ESS finalized November 2016 and approved by DDESB in January 2017
- General munitions response activities at all sites included:
 - Site surveying/Vegetation removal
 - Pre-geophysical survey surface clearance
 - Digital Geophysical Mapping (DGM) or analog geophysical surveys
 - Anomaly excavation/investigation
 - Management and disposal of MPPEH

MPPEH Processing Flow Chart



Work Plan Challenges



- Work Plan was a large document with numerous sites
- Original Work Plan included UXO 4, 5, 12, & 21 with UXO 1, 2, 10, 23, & 28 added later
- Change in EPA RPM created delays as Work Plan was submitted to BTAG and other technical reviewers
- EPA was concerned with previous BERA and ERA and the SI Report from 2010 was reviewed (again)

Key Message: Assume regulators will have numerous comments/questions and may delay finalization of Work Plans

Scope of Intrusive Work (vs. Removal Action)



- Ensure that contractor is completing work in accordance with approved ESS
- NAVEODTECHDIV from Stump Neck was used for QA checks and audit prep
- Regulators were concerned that contractor was performing a removal action and not just an RI (mostly for UXO 5)
- Regulators expressed concern in limiting intrusive work since the assumed remedy will be land use controls for many sites

Other Challenges/Concerns



- Base access for contractors (changeover from RAPIDGATE to DBIDS system) caused potential delays
- Logistics with base operations and active ranges
- Wetland impacts (mainly UXO 10-Stump Neck Impact Area)
- Bald Eagle nesting season time-of-year restrictions (December 15- June 15)
- Expiring FY12 funds
- Management of scrap metal/MPPEH

Key Message: Plan ahead for removal of scrap and MPPEH and make sure regulators understand the goals of the investigation.

Fieldwork Overview



- Site surveying conducted in May-June 2017
- Site preparation activities began in June 2017
- Intrusive investigation activities began in July 2017
- Investigation results are available for:
 - UXO 2
 - UXO 4
 - UXO 5
 - UXO 12
 - UXO 23
 - UXO 28

MEC RI Approach- Area 8 (UXO 2)

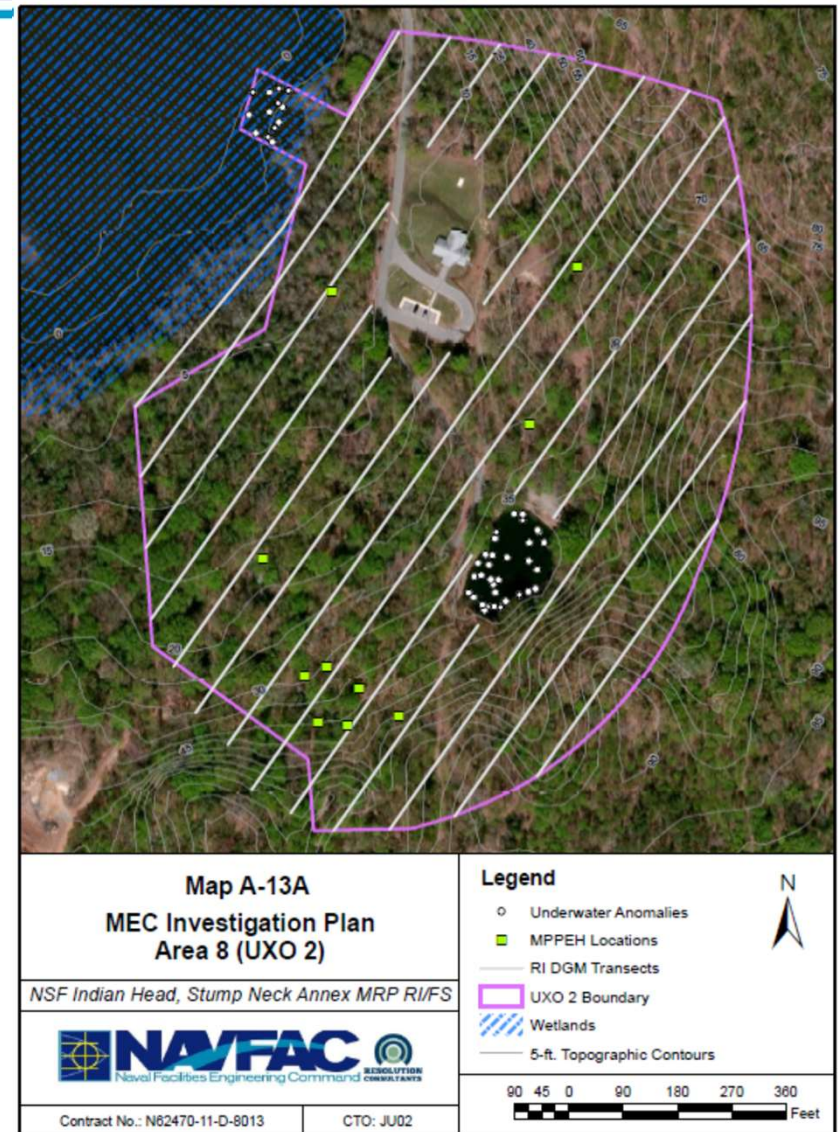


RI Goal:

- Characterize spatial and vertical distribution and nature of hazardous munitions items
- Characterize nature of underwater anomalies in pond and creek

RI Approach:

- Land-based DGM on statistical transect design
- Removal of underwater anomalies via magnet

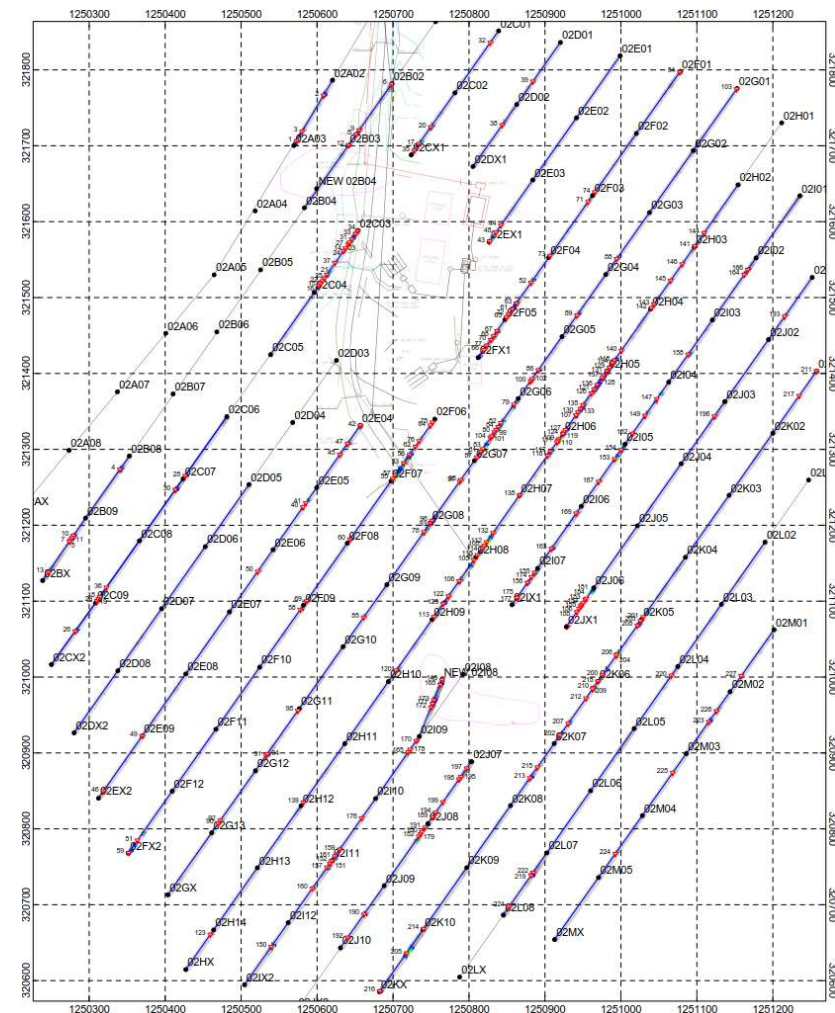


MEC RI Results- Area 8 (UXO 2)



RI Results:

- DGM survey resulted in 227 identified anomalies requiring investigation
- Nine munitions-related debris items encountered
- Items included:
 - Mine components/parts
 - Torpedo warhead, empty
 - Projectile parts
 - 57mm AP projectile
- No items contained explosive hazards
- 93% of targets were cultural debris (i.e., not munitions-related)



MEC RI Results- Area 8 (UXO 2)



U.S. Navy



U.S. Navy

57mm projectile (solid steel)



U.S. Navy

Practice Mines

MEC RI Approach- Basic IED Area (UXO 4)

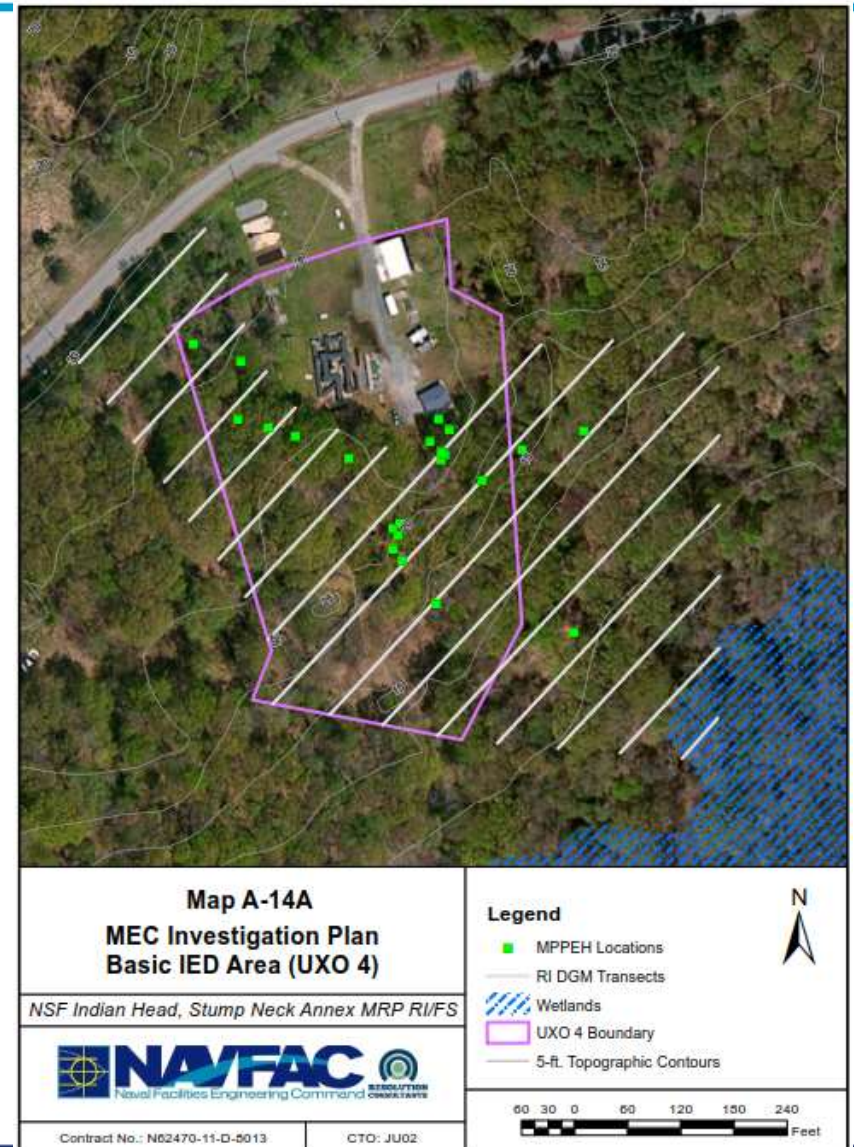


RI Goal:

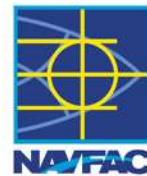
- Characterize spatial and vertical distribution of hazardous munitions items

RI Approach:

- DGM on statistical transect design



MEC RI Results- Basic IED Area (UXO 4)



RI Results:

- DGM survey resulted in 285 identified anomalies requiring investigation

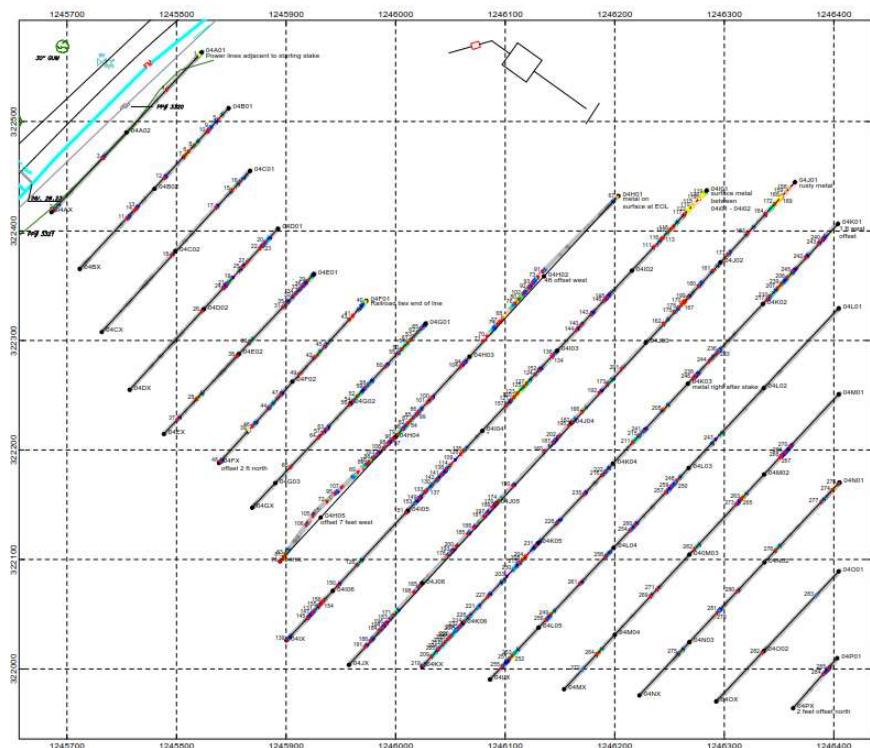
- 35 munitions-related debris items encountered

- Items included:

- Practice mines/mine components
- 75mm projectiles, shrapnel (empty)
- Fuzes
- 500lb Bomb (empty)
- 2.75in Rocket fins
- Practice grenade
- 60mm & 81mm Mortars (empty)

- No items contained explosive hazards

- 84% of targets were cultural debris



MEC RI Results- Basic IED Area (UXO 4)



Fuze Piece



Projectile Fuze



Practice Grenade



Mine Component



500lb Bomb

All Photos by
U.S. Navy

MEC RI Approach- Advanced IED Area (UXO 5)

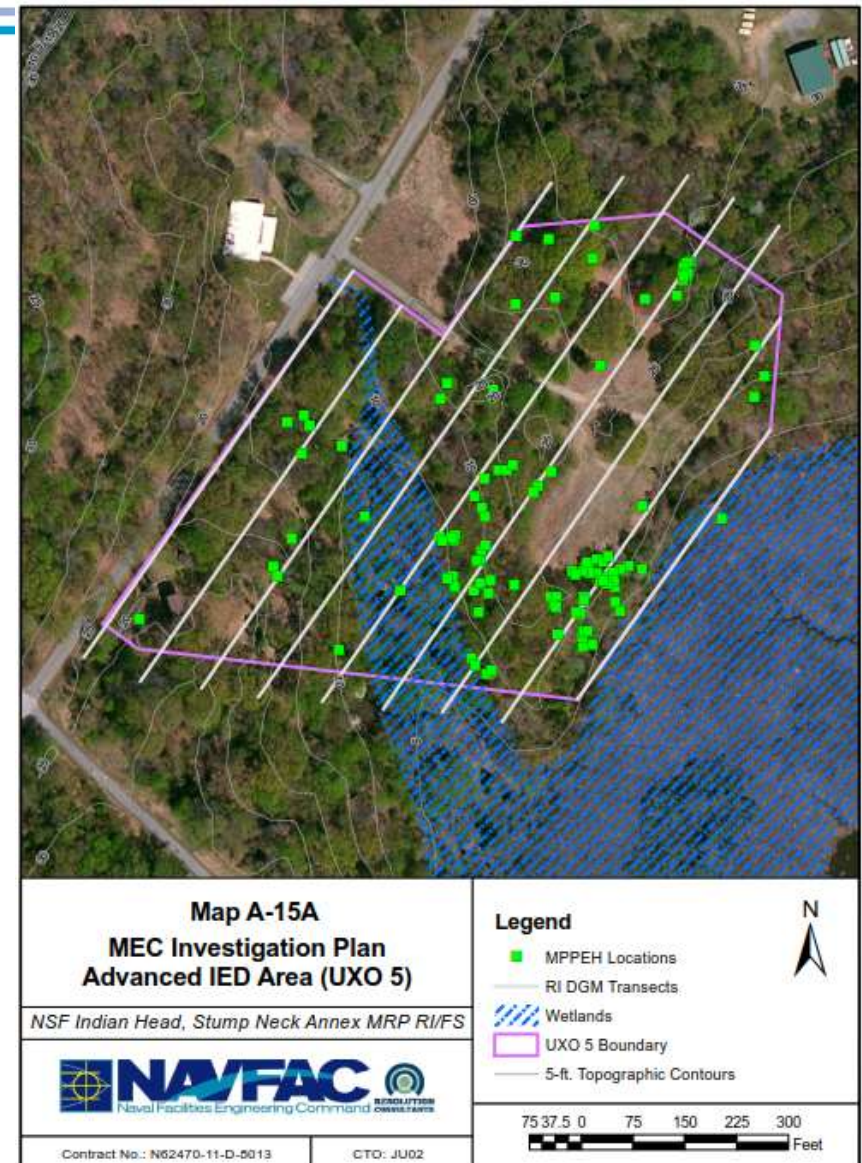


RI Goal:

- Characterize spatial and vertical distribution of hazardous munitions items

RI Approach:

- DGM on statistical transect design

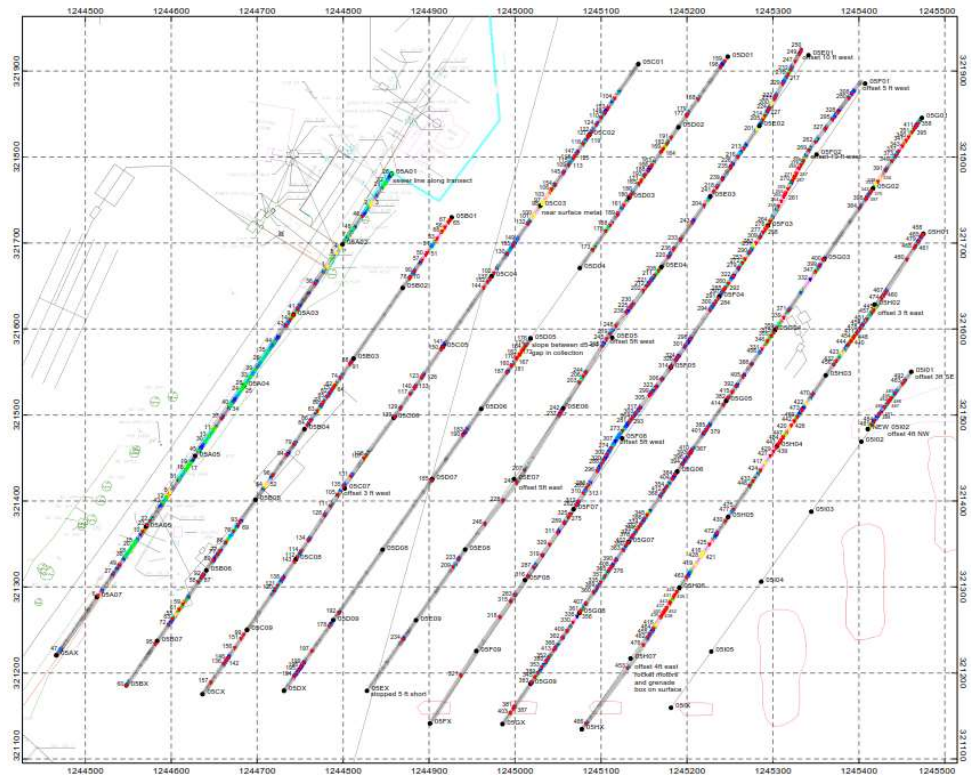


MEC RI Results- Advanced IED Area (UXO 5)

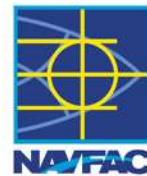


RI Results:

- DGM survey resulted in 492 identified anomalies requiring investigation
- 169 munitions-related debris items encountered
- Items included:
 - Fuzes/fuze parts (mostly M100)
 - 5in Rocket warhead (inert)
 - 2.75in Rocket motor component
 - 20lb Bombs (empty)/bomb parts
 - 100lb Bomb (inert)
 - BDUs 28 (inert)
 - BLUs 7 (inert)
 - BLU 36 (inert)
 - CS Smoke canister (inert)
 - 105mm projectile (inert)
 - 75mm projectile, shrapnel (empty)
 - 20mm cartridge (inert)
 - Practice mine
- No items contained explosive hazards



MEC RI Results- Advanced IED Area (UXO 5)



U.S. Navy

75mm Projectile Casing



U.S. Navy

Practice Anti-tank Mine



U.S. Navy

100lb Bomb



U.S. Navy

2.75" Rocket Components

MEC RI Approach- Advanced IED Area (UXO 5) Bunker



RI Goal:

- Characterize nature of munitions items deposited in bunker

RI Approach:

- Remove top of concrete, excavate exposed munitions items, and remove munitions from bunker for inspection



U.S. Navy



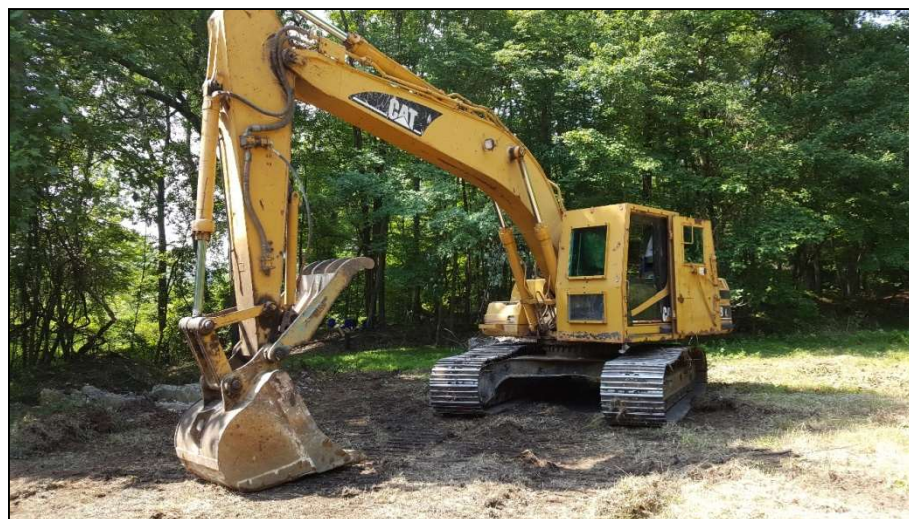
MEC RI Results- Advanced IED Area (UXO 5) Bunker



RI Results:

- Recovered over 2,000 lbs. of munitions debris
- Items consisted of pieces/parts of munitions and inert ordnance items
- No items have contained explosive hazards
- Some items remain encased in concrete

All Photos by
U.S. Navy



MEC RI Approach- Torpedo Burial Site (UXO 12)

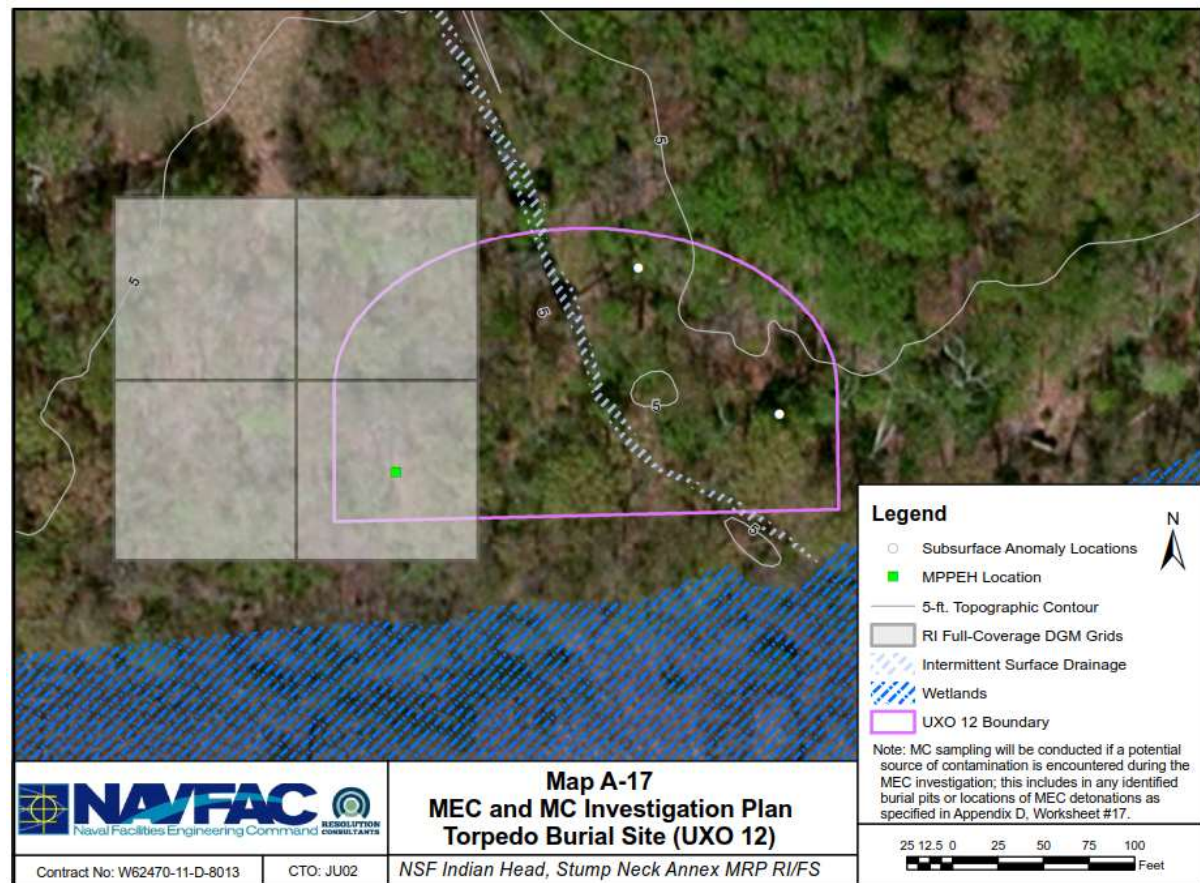


RI Goal:

- Identify/Characterize munitions items associated with the identified subsurface anomalies

RI Approach:

- Full-coverage DGM (1 acre)

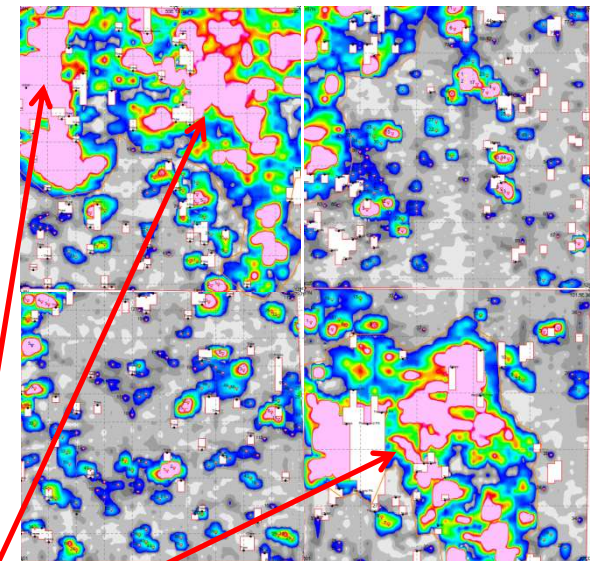


MEC RI Results- Torpedo Burial Site (UXO 12)



RI Results:

- DGM identified several potential burial areas
- Investigation revealed that no burial pits are present
 - Various debris appears to have been deposited on surface
 - Deepest anomaly recovered at depth of 18 inches
- Non-hazardous munitions-related items included:
 - 57mm projectile
 - Igniter
 - Sea mines (empty)



Identified Locations Indicative of
Potential Disposal Areas

MEC RI Results- Torpedo Burial Site (UXO 12)



Sea Mine



Scrap Metal



Scrap Metal

All Photos by
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MEC RI Approach- Torpedo Casing Disposal Site (UXO 23)

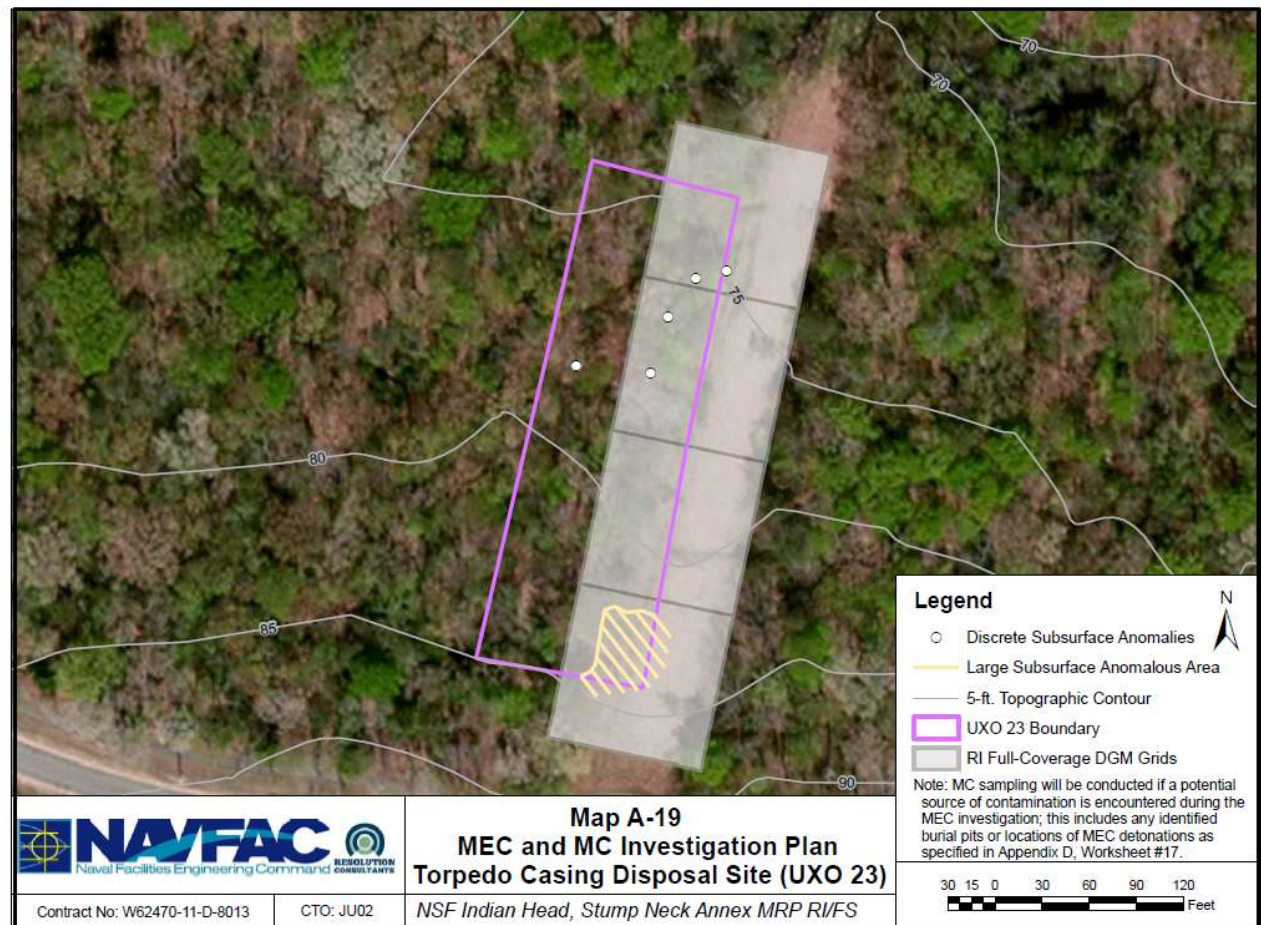


RI Goal:

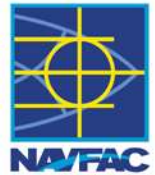
- Identify/Characterize munitions items associated with the identified subsurface anomalies

RI Approach:

- Full-coverage DGM (1 acre)



MEC RI Results- Torpedo Casing Disposal Site (UXO 23)

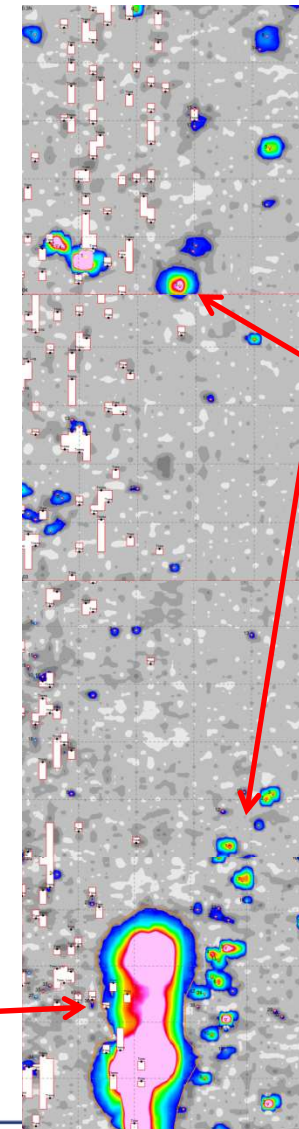


RI Results:

- DGM identified a burial pit and several isolated anomalies
- Burial Pit:
 - Depth exceeds 11 feet
 - Removed numerous large pieces of Naval materiel (none contained explosive hazards)
 - No torpedo casings found
- Isolated anomalies:
 - 90mm projectiles and practice bombs (none contained explosive hazards)

Burial Pit

Isolated anomalies



MEC RI Results- Torpedo Casing Disposal Site (UXO 23)



Sea Mine Casing



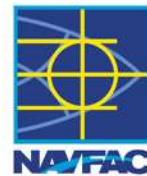
Electrical Equipment



200lb Bomb

All Photos by
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MEC RI Approach- EOD School Demolition Area (UXO 28)

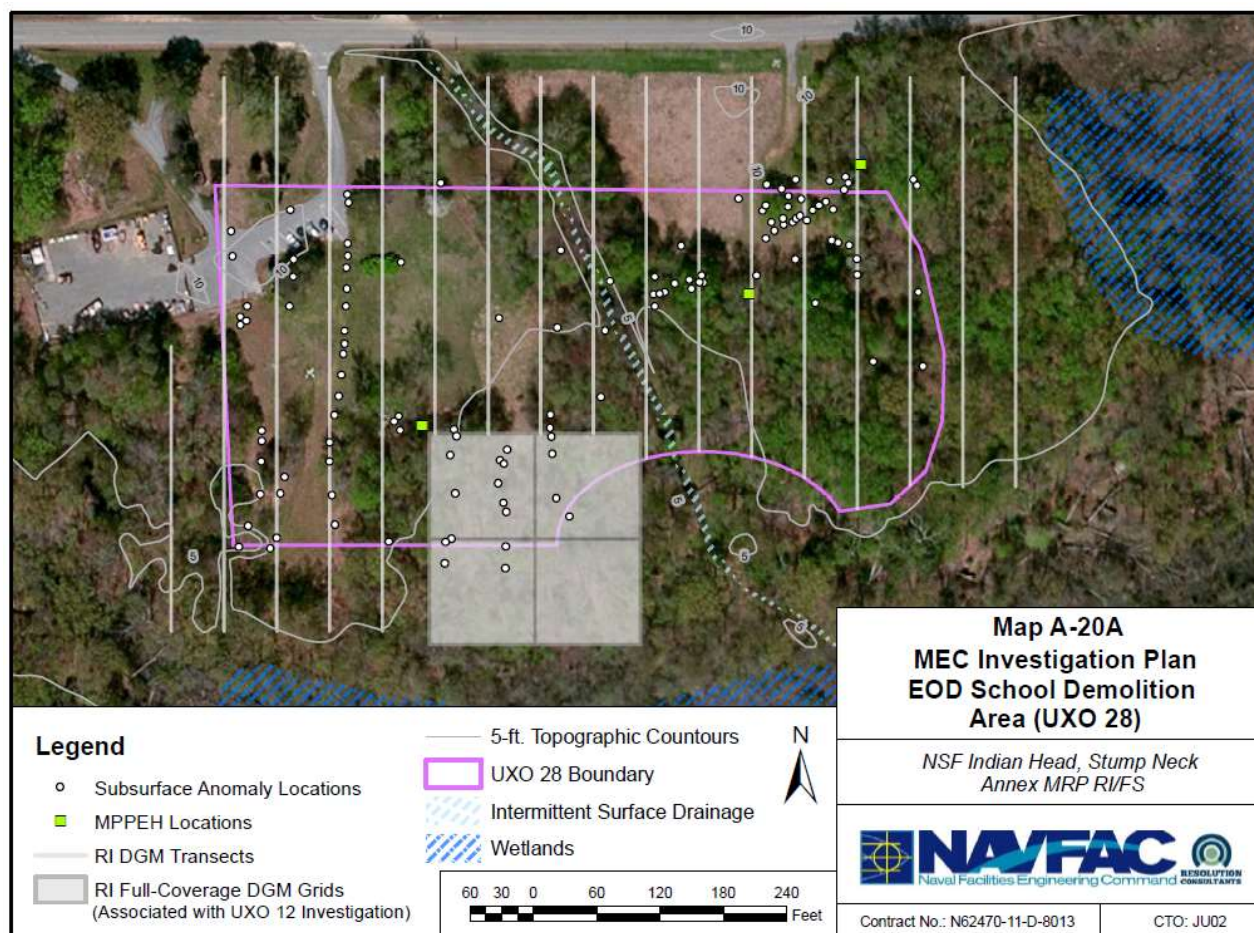


RI Goal:

- Characterize spatial and vertical distribution of hazardous munitions items

RI Approach:

- DGM on statistical transect design

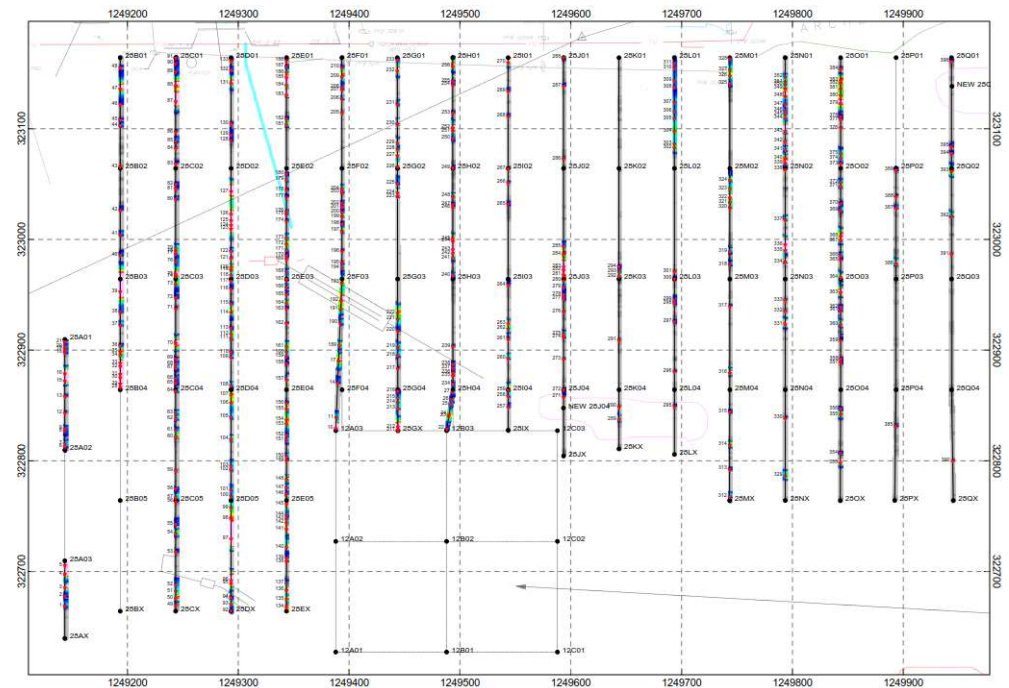


MEC RI Results- EOD School Demolition Area (UXO 28)

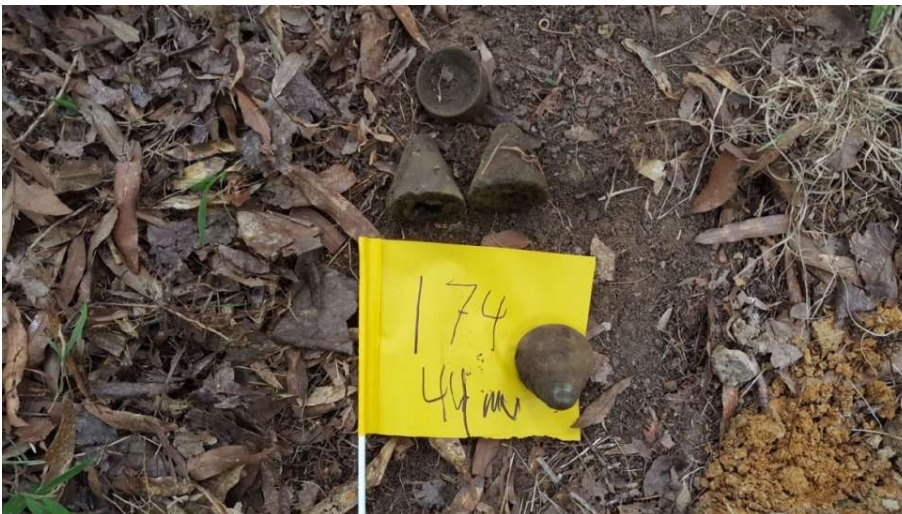


RI Results:

- DGM survey resulted in 396 identified anomalies requiring investigation
- 7 munitions-related debris items encountered
- Items included:
 - M4 magazine
 - Flares, empty
 - Bomb fuze, British
 - Projectile base, 57mm
 - Fuze pieces/parts
- No items contained explosive hazards
- 68% of targets were identified as 'scrap metal'



MEC RI Results- EOD School Demolition Area (UXO 28)



U.S. Navy

Fuze Parts (nose fuzes)



U.S. Navy

British Fuze

Demolition Event



Demolition conducted on 9/27/17 to perforate non-hazardous munitions items prior to sending them to processing facility

- Ensured processing facility can readily identify items as non-hazardous
- Items perforated with commercial explosives
- Post-detonation soil samples were collected from the trench



All Photos by
U.S. Navy

Knowledge Check



- **How are primary and contingency MGFDs selected for an ESS?**
 - a) based on item you're likely to find
 - b) based on item you can possibly find
 - c) combination of both a and b
- **How much time can be expected to review and approve an ESS?**
 - a) 0-6 months
 - b) 6-12 months
 - c) depends on several factors
- **How can ESS comments be minimized and streamline review time?**
- **Why is it important for regulators to fully understand project scope?**

Summary



Project Cost/Length:

- Approximately \$2.9mil total
 - \$809K (UXO 4 & 21) in FY12
 - \$743K (UXO 5 & 12) in FY13
 - \$1.4mil (UXO 1, 2, 10, 23, & 28) in FY15
- Fieldwork lasted 5 months, but planning/ESS/Work Plan etc. took 5 years

Key Take Away Messages

- Allow up to 12 months in project schedule for ESS review and approval
- Engage NOSSA early and often when drafting an ESS to streamline review
- Plan for numerous rounds of comments from regulators and input from technical support staff
- Carefully consider level of effort required for intrusive RI work- are sites anticipated to require NFA, LUCs, or a RA?

Contacts and Questions



Points of Contact

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Questions ?